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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/630,778

07/31/2003

Fong Shi

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7891

7590

06/30/2004

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EXAMINER

CAO, PHAT X

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,778

Applicant(s)

SHI, FONG

Examiner

Phat X. Cao

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 19-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-18 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7/31/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I (claims 1-18) in the reply filed on 4/29/04 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al (US. 6,462,405) in view of Maley (US. 6,249,136).

Lai (Fig. 2) discloses a hermetic device comprising: a substrate 40; an electronic package 41 disposed on the substrate; a sealant 43 disposed on the electronic package; and solders 42 attached to seal the electronic package 41 to the substrate 40.

Lai does not disclose a Backside Interconnect extending through the electronic package 41 from the top to the bottom surfaces.

However, Maley (Fig. 7) teaches an electronic package having a Backside Interconnect 112 extending from the top to the bottom surfaces. Accordingly, it would have been obvious to form the Backside Interconnect extending through the electronic package 41 of Lai from the top to the bottom surfaces because as taught by Maley, such Backside Interconnect is commonly used and well known for providing the

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connection to the package substrate from the circuitry formed on the top surface of the electronic package (column 3, lines 54-67 through column 4, lines 1-7).

4. Claims 1-4, 7, 9-14, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al in view of Maley and Heckaman et al (US. 5,023,624).

Regarding claims 1-4, 12-14 and 17-18, as discussed in details above, the combination of Lai and Maley substantially reads on the above claims, including a conformal coating 35 disposed on the sealant 43 and a cover 34 disposed on the conformal coating 35. The above combination does not disclose the electronic package is MMIC.

However, Heckaman (Fig. 1) teaches a hermetic device comprising an electronic package of MMIC or Phased Array Antenna (PAA) disposed on the substrate 20 (column 8, lines 40-50). Accordingly, it would have been obvious to form the electronic package of Lai as MMIC or PAA because it is an intended use depending upon the application which is desired for the package device, as taught by Heckaman (column 8, lines 40-50).

Regarding claim 7, Heckaman further teaches the forming of a high performance support substrate (e.g. Ga As) for high frequency applications (column 1, lines 19-21).

Regarding claims 9-10, Lai's Fig. 2 further discloses the solder attachment 42 along a periphery of the electronic package 41, to seal the electronic package 41 to the substrate 40.

Regarding claim 11, it would have been obvious to form the solder attachment 42 made of AuSn because AuSn is a well-known solder material which has a low melting point.

5. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al as and Maley applied to claim 1 above, and further in view of Patel (US. 5,396,403).

Regarding claim 5, Lai discloses the thermally conductive material 43 made of a metallic material (column 7, lines 7-14), but not a silicon carbide material.

However, Patel (Fig. 1) teaches a hermetic device having a sealant 19 of thermally conductive material formed on an electronic package 13 and made of a metallic material or silicon carbide material (column 4, lines 64-68). Accordingly, it would have been obvious to form the thermally conductive material of Lai with either metallic or silicon carbide because as taught by Patel, both of these materials would have a relatively low coefficient of expansion (column 4, lines 64-68).

Regarding claim 8, Patel further teaches that the thickness of silicon carbide thermally conductive layer is not critical and may adjusted as desired according to such factors as the size of the electronic package and the thermal conductivities of the specific materials being used (column 5, lines 13-17).

Allowable Subject Matter

6. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The prior art fails to disclose the SiC disposed over BCB interlayer dielectric.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (571) 272-1703. The examiner can normally be reached on Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PC
June 25, 2004


PHAT X. CAO
PRIMARY EXAMINER